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Poliomyelitis in Japan during the period 1962–68 after the introduction of mass vaccination with Sabin vaccine

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After the mass vaccination of children of susceptible age groups in Japan in 1961, the incidence of poliomyelitis decreased markedly. From 1962 to 1968 a total of 659 paralytic cases were officially notified. Detailed investigations of 626 cases reported to the Poliomyelitis Surveillance Committee revealed that only 185 (29.6%) were cases of paralysis clinically typical of poliomyelitis. Tests on 120 of these 185 cases showed that 75 (62.5%) were positive for poliovirus: 45 of these positive cases were temporally associated with the administration of live poliovirus vaccine and 36 had some residual disability. Wild types of poliovirus were rarely isolated. Only 36 vaccine-related cases of poliomyelitis were observed among the total of more than 11 million newborn infants vaccinated with Sabin vaccine in the period 1962–68.

Official notification of all poliomyelitis cases became compulsory in Japan in September 1947. Between 1948 and 1959 the annual incidence of notified polio cases was about 2 000–3 000, indicating morbidity rates of 1.5–5.0 per 100 000 population. In 1960, the worst year for poliomyelitis in Japan, 5 606 cases were reported. In the late spring and early summer of 1961, outbreaks of poliomyelitis occurred in the south-western part of the country, and the Government decided to use Sabin vaccine to counter the epidemics. Thereafter there was a remarkable decline in the number of reported cases. This was followed by nationwide mass vaccination campaigns in 1962 and 1963. This report summarizes the results of poliomyelitis surveillance from 1962 to 1968.

SURVEILLANCE OF CLINICAL POLIOMYELITIS CASES

The health centres concerned report all poliomyelitis cases to the Statistics Bureau of the Ministry of Health and Welfare through the provincial health department. Since the reports do not include details of the cases, the Poliomyelitis Surveillance Committee (PSC) asked the Ministry of Health to obtain detailed records of each notified case. The Committee has also tried to obtain information on other cases of persistent paralysis that were not notified. In this paper, notified cases refer to those listed in the official publications of the Statistics Bureau, and reported cases refer to those for which the PSC obtained detailed case records; the reported cases thus include most of the officially notified cases as well as several additional cases that were not notified.

On the basis of the clinical records the cases were classified as follows:

(1) Category A—typical paralytic poliomyelitis;

(2) Category B—atypical paralytic cases; polyneuritis, Guillain–Barré syndromes, facial palsy, myelitis, etc., and also cases of hemiplegia with normal tendon reflexes;

(3) Category C—nonpoliomyelitis cases that could be differentiated by clinical records. Cases of aseptic meningitis without paralysis are usually not reported officially in Japan as poliomyelitis, and such cases, when notified, were classified clinically as category C. Classification of the cases by laboratory findings was based on the results of poliovirus isolation and/or diagnostic serology. Vaccine-asso-

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ciated cases of dual infection with vaccine virus and nonpoliovirus were excluded from the group of cases positive for poliovirus infection.

Cases meeting the following criteria were placed in a category of " vaccine-related " cases: (1) onset of illness between 4 and 30 days following the administration of live poliovirus vaccine (LPV), (2) clinically classified as category A, (3) virologically classified as positive for poliovirus infection, with the isolation of a serotype poliovirus that could be classified as " vaccine-like " by the intratypic serodifferentiation test.

INCIDENCE OF POLIOMYELITIS AND VACCINATION WITH SABIN VACCINE

The first large epidemic of poliomyelitis after the Second World War occurred in the northern part of Japan from 1949 to 1951, and the number of notified cases was 4 233 in 1951 with a morbidity of 5.0 per 100 000 population for the whole country. The annual incidence declined gradually thereafter to a minimum in 1955. Subsequently the annual number of cases increased again reaching a peak in 1960. Inactivated poliovirus vaccine was not produced on a large scale in Japan until 1960 and vaccination with Salk vaccine hardly affected the number of cases in the outbreaks of 1960 and early 1961. Thirteen million doses of trivalent Sabin vaccine were imported and released for use in late July and August 1961. This total included 3 million doses of a Canadian fluid vaccine with indicated titres as follows—type 1, 10^6 $TCID_{50}$; type 2, $10^{5.5}$ $TCID_{50}$; type 3, $10^{5.5}$ $TCID_{50}$; and 10 million doses of Russian dragee vaccine with indicated titres of more than 10^5 $TCID_{50}$ for each serotype. In 1962 the second mass vaccination of children from 3 months to 12 years of age was carried out with a total of 17 million doses of both type 1 monovalent and types 2 and 3 divalent vaccines, each containing $10^{5.5}$ $TCID_{50}$. In 1963 an additional 10 million doses of both types 1 and 2 divalent ($10^{5.5}$ $TCID_{50}$ each) and type 3 monovalent ($10^{5.3}$ $TCID_{50}$) vaccines were used. These campaigns covered almost all target children with at least 2 doses of all 3 types of live oral vaccine. The vaccines used in 1962 and 1963 were imported from Canada and the USSR. Since 1964 infants have been vaccinated between the ages of 3 months and 18 months with 2 doses of home-produced trivalent Sabin vaccine containing $10^{5.3}$ $TCID_{50}$ of each serotype. Routine vaccinations are usually carried out in local health centres over a short period in the spring or autumn.

ANNUAL AND GEOGRAPHICAL DISTRIBUTION OF CASES

The annual incidence of notified cases from 1957 to 1968 and of reported cases from 1962 to 1968 is shown in Table 1. Most of the notified cases were reported to the Poliomyelitis Surveillance Committee (544/659, 82.5%) and 54 cases not officially notified were also reported directly to the PSC. Since 1962 the incidence has been quite low and no differences have been observed between regions.

Table 1. Annual incidence of poliomyelitis in Japan 1957–68

Year	Notifications to MHW [a]	Reports to PSC [b]
1957	1 718 (1.9)	—
1958	2 610 (2.8)	—
1959	2 917 (3.1)	—
1960	5 606 (6.0)	—
1961	2 436 (2.6)	—
1962	289 (0.3)	231
1963	131 (0.1)	129
1964	84 (0.1)	98
1965	76 (0.1)	63
1966	33	41
1967	26	33
1968	20	31
total (1962–68)	659	626 [c]

[a] Ministry of Health and Welfare: figures in parentheses show the morbidity rate per 100 000 population.

[b] Poliomyelitis Surveillance Committee.

[c] Notified cases: 544; cases not notified: 54; notification not specified: 28.

CLASSIFICATION AND SEASONAL INCIDENCE OF CASES

The classification of the 626 reported cases by clinical category, sex, and laboratory diagnosis is shown in Table 2. The incidence of category A cases among males (71.4%) was significantly higher than among females ($P<0.001$).

The number of category A cases was highest in the period from May to July and low during the winter season. The seasonal pattern of category B cases was more irregular with a peak in August (Fig. 1). Cases with positive poliovirus infection were more frequently observed in the months from April to June

Table 2. Classification of reported cases (1962–68) in relation to clinical category, sex, and the results of laboratory diagnosis

Clinical category	No. of cases reported [a]	Sex		Laboratory diagnosis		
		Male	Female	Positive	Negative	Unknown
A (typical)	185 (29.6)	132	53	75	45	65
B (atypical)	352 (56.2)	200	152	25	137	190
C (nonpoliomyelitis)	89 (14.2)	45	44	2	23	64
total	626 (100)	377	249	102	205	319

[a] Figures in parentheses show the percentage.

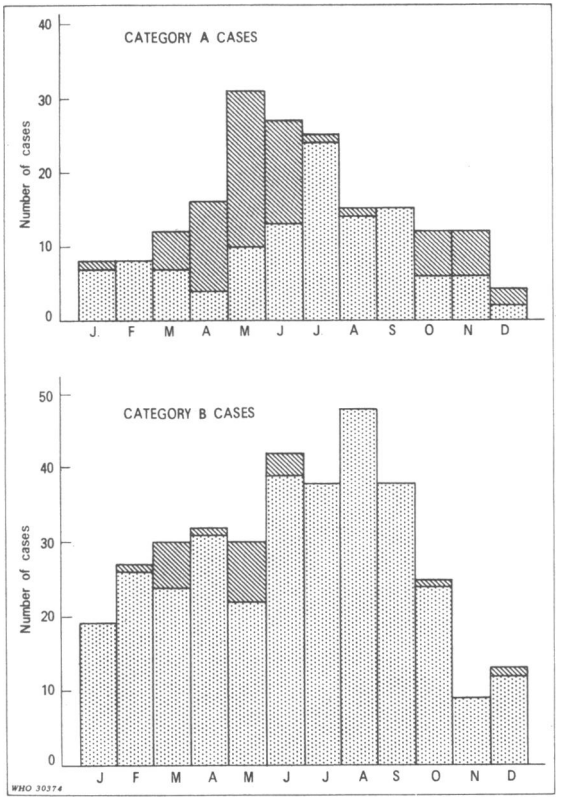

Fig. 1. Monthly distribution of category A and B cases, 1962–68. Shaded portions indicate temporally vaccine-associated cases.

because temporally vaccine-associated cases are included in this group. Most of the poliovirus isolates from clinical cases were vaccine-like (Tagaya et al., 1973).

AGE DISTRIBUTION, VACCINATION HISTORY, AND RESIDUAL PARALYSIS OF THE REPORTED CASES

Before 1961 the peak incidence of poliomyelitis in Japan was clearly among young children. During the 7 years after the mass vaccination with live poliovirus vaccine, 47.5% of the notified cases were under 5 years of age, while 75.1% of the category A cases, and 89.4% of the virologically confirmed cases, were under 5 years of age (Table 3). The vaccination history and clinical status at follow-up of the reported cases (categories A and B) are shown in Tables 4 and 5. Details of the clinical status at follow-up were available for 163 (88.1%) of the 185 category A cases, of which 3 (1.6%) were fatal. Complete recovery was recorded in 52 (32.5%) of 160 nonfatal cases, while 108 (67.5%) remained with residual disability.

LABORATORY DIAGNOSIS OF THE REPORTED CASES

Of the cases for which laboratory diagnosis gave evidence of poliovirus infection (Table 2), 2 category C and 9 category B cases were temporally vaccine-associated and were considered as coincidental. The laboratory diagnosis data for the category A cases are summarized in Table 6. Most of the poliovirus isolates from category A cases were sent to the National Institute of Health and all the isolates examined were considered as vaccine-like (Tagaya et al., 1973). On the basis of epidemiological and serological investigations, 5 cases (2 cases of type-2 infection and 3 of type-3) were suspected of being direct or indirect contact cases. Four of these cases remained with residual paralysis.

Table 3. Age distribution of poliomyelitis cases registered before and after the introduction of live poliovirus vaccine (LPV) [a]

Age group (years)	No. of cases before introduction of LPV, 1957–61	No. of cases after introduction of LPV, 1962–68 [b]	No. of cases by clinical category, 1962–68		
			A	B	C
0–4	12 617 (82.5)	313 (47.5)	139 (75.1)	138 (39.2)	28 (31.4)
5–9	1 619 (10.6)	99 (15.0)	20 (10.8)	66 (18.7)	19 (21.4)
10–14	482 (3.2)	88 (13.4)	17 (9.2)	50 (14.2)	16 (18.0)
15–19	228 (1.5)	65 (9.9)	16 (3.2)	51 (14.5)	9 (10.1)
⩾20	342 (2.2)	93 (14.1)	3 (1.6)	47 (13.4)	17 (19.1)
As above—confirmed cases, 1957–61 [c]			No. of confirmed cases in category A, 1962–68		
0–4	2 318 (86.3)		67 (89.4)		
5–9	278 (10.4)		4 (5.3)		
10–14	61 (2.3)		3 (4.0)		
15–19	13 (0.5)		0		
⩾20	14 (0.5)		1 (1.3)		

[a] The figures in parentheses are percentages.

[b] Plus one case of unspecified age.

[c] Data compiled from published reports by various authors, as well as unpublished data from the Department of Enteroviruses, National Institute of Health, Tokyo.

Table 4. Vaccination history of paralytic cases of categories A and B, 1962–68

Clinical category and vaccine-association	No. of cases	No. of doses of LPV [a]			
		0	1	⩾2	Unknown
Category A					
temporally vaccine-associated	68	—	58 (0)	10 (1)	0
others	117	39	38 (12)	27 (9)	13 [b]
Category B	352	134 (5)	68 (21)	109 (30)	41 [c]

[a] The figures in parentheses indicate the number of persons who received more than 2 doses of inactivated poliovirus vaccine. When the illness commenced within 1 month after the first dose of LPV the subjects are regarded as having had 1 dose of LPV.

[b] Including 5 persons who had received an unknown number of doses of LPV.

[c] Including 11 persons who had received an unknown number of doses of LPV.

Table 5. Extent of residual disability in clinical category A and B cases, 1962–68

Clinical category and vaccine-association	No. of cases	Complete recovery	Extent of residual disability [a]				
			Minor	Significant	Severe	Fatal	Unknown
Category A							
temporally vaccine-associated [b]	68	15 (8)	21 (13)	24 (20)	5 (3)	0	3 (1)
others [c]	117	37 [1]	33	25 [4]	0	3	19
Category B	352	102	83	21	16	58	72

[a] Evaluated 30–60 days after the onset of illness.

[b] Figures in parentheses represent vaccine-related cases.

[c] Figures in square brackets represent possible contact cases.

Table 6. Summary of laboratory diagnosis of clinically typical poliomyelitis cases (category A), 1962–68

		Temporally vaccine-associated cases [a]	Other cases
No. examined/No. reported		63 (4)/68 (4)	82 [b]/117
Poliovirus positive			
total		45 [c] (1)	27
no. with residual disability		36	17
residual disability unknown		1	2
Type(s) of poliovirus isolated	type 1	1	1
	type 2	10	4
	type 3	12	8
	types 1, 3	1	0
	types 2, 3	15 [d]	0
Antibody rise against	type 1	0	6
	type 2	7	6
	type 3	14	9
	types 1, 2	0	1
	types 1, 3	0	2
	types 2, 3	14 [e]	0
	types 1, 2, 3	5	2

[a] Figures in parentheses indicate the number of cases occurring after vaccination with a vaccine not including type 3 virus.

[b] Enteroviruses other than poliovirus were isolated from 8 cases without evidence of poliovirus infection.

[c] Three other cases excluded from this total, showed dual infection with vaccine virus and another enterovirus.

[d] Includes 3 cases of the dual infection noted above.

[e] Includes 2 cases of the dual infections noted above.

HISTOPATHOLOGICAL FINDINGS OF AUTOPSIED CASES

Twenty-one cases were reported on which autopsies had been performed, 17 of category B and 4 of category C; the distribution of these cases by age was as follows: under 12 months 1 case, 1–5 years 5 cases, 6–10 years 2 cases, 11–20 years 6 cases, 21–30 years 4 cases, and over 40 years 3 cases. Histological examination showed no evidence of acute anterior poliomyelitis. Some of them were cases of suppurative meningo-encephalitis or encephalitis of known or unknown etiology and some of them were cases of suspected polyneuritis. Although the autopsy rate of fatal cases was not high and no autopsy was performed on a case of clinical category A, the histopathological findings of these 21 cases of clinical categories B and C appear to corroborate the accuracy of the clinical classification of the reported cases.

ANALYSIS OF THE CASES TEMPORALLY ASSOCIATED WITH VACCINATION

Ninety-four cases reported to PSC were temporally vaccine-associated. Clinically, 68 cases (72.3%) were classified in category A, 21 (22.4%) in category B, and 5 (5.3%) in category C. There was little variation in the annual incidence of vaccine-associated category A cases, the number varying between 8 and 12 per annum between 1962 and 1968. As shown in Table 4, most of the category A cases were observed after their primary dose of LPV. Of the 20 vaccine-associated cases in 1962 and 1963, when trivalent vaccine was not used, only 4 occurred after vaccination with a vaccine that did not include type 3 virus. Most of the cases were male and they usually occurred from 10 to 19 days after vaccination (Table 7). Follow-up data are available for 65 of the 68 category A patients: 15 (23.0%) recovered com-

Table 7. Sex distribution and interval between vaccine feeding and the onset of illness for temporally vaccine-associated category A cases, 1962–68

Category	Male	Female
No. of temporally vaccine-associated category A cases	58 (85.3%)	10 (14.7%)
No. of other category A cases	74 (63.2%)	43 (36.8%)

Interval between vaccine-feeding and onset of illness (days)	Number of temporally vaccine-associated cases	
	Category A	Category B
0–4	0	4
5–9	6	5
10–14	23	5
15–19	24	2
20–24	7	0
25–30	6	1
unknown [a]	2	4
total	68	21

[a] The interval between LPV and the onset of illness was not specified, but was reported as being between 4 and 30 days after vaccine feeding.

pletely and 50 (70.0%) remained disabled (Table 5). No fatal case has ever been reported. The monthly incidence and age distribution of these cases are shown in Fig. 1 and 2 and the peak incidence of category A cases is observed from May to July. The peak incidence of vaccine-associated cases was in May (Fig. 1), while the peak incidence of the other cases of category A was in July. Most vaccine-associated cases were in infants under 1 year of age, 6–7 months being the most common age (Fig. 2). All the poliovirus strains isolated from these vaccine-associated cases were shown to be vaccine-like. Consequently 45 cases were considered to be vaccine-related and 36 of them had residual disabilities. Type-3 poliovirus infection was demonstrated most frequently, type-2 infection the next most frequently, and only few type-1 infections were discovered (Table 6). As shown in Fig. 1, vaccine-associated cases were seen far less frequently among category B cases than among category A cases. Since it is highly probable that these category B cases were coincidental, these data suggest a relationship with vaccination of at least some of the temporally vaccine-associated cases in category A. The clustering of category A cases in the periods from 10 to 19 days after vaccination also suggests a relationship between vaccination and illness in contrast to the random distribution of category B cases.

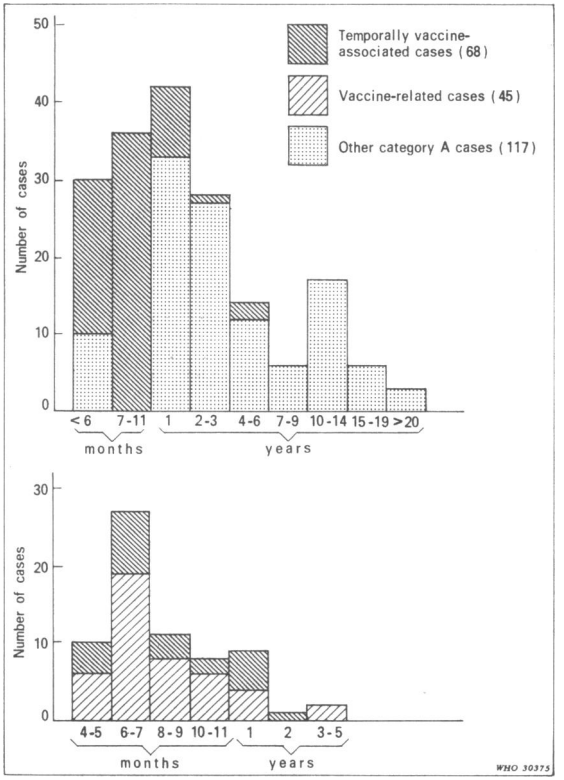

Fig. 2. Age distribution of category A cases, 1962–68.

SURVEY OF THE IMMUNITY STATUS OF THE POPULATION AGAINST POLIOVIRUS AND THE CIRCULATION OF POLIOVIRUS AMONG CHILDREN

Since 1962 a collaborative study has been carried out by local public health laboratories under the sponsorship of the Ministry of Health and Welfare. The study has consisted of two parts: (1) a serological survey of levels of antibody against poliovirus, and (2) the isolation and identification of poliovirus from the faeces of healthy children in a period when there was no vaccination.

Serological survey.

Prior to use sera were inactivated at 56° C for 30 minutes. Neutralization tests were performed in tube cultures of HeLa cells or other cell lines with established susceptibility to poliovirus, or in cultures of primary monkey kidney (MK) cells, about 100 $TICD_{50}$ each of type 1, Mahoney strain; type 2, MEF 1 strain; and type 3, Saukett strain being used. The procedures have been described elsewhere (Japan Live Poliovaccine Research Commission, 1966). The results of these surveys were fairly similar from year to year and showed that immunity against poliovirus remained at a satisfactory level in Japan.[1]

Poliovirus survey

Specimens were collected twice a year not less than 2 months after the completion of the spring and autumn routine vaccinations. In 1962 and 1963 only one collection was made. The tests were performed with MK cells and the procedures have been described elsewhere (Japan Live Poliovaccine Research Commission, 1966): 2nd passage poliovirus was used in the identification tests.

The results indicated that the circulation of poliovirus among children is quite low, if specimens are collected after a period of routine vaccination as described (Table 8). Type 2 virus was isolated most frequently, although the rate of isolation was quite low. Some strains were examined by the intratypic serodifferentiation test and all proved to be vaccine-like (Tagaya et al., 1973).

Table 8. Poliovirus isolation from faecal specimens from healthy children collected not less than 2 months after the routine vaccination

Year	Time of specimen collection	No. of specimens examined	No. of cyto-pathogenic agents isolated [a]	Poliovirus isolated				Other cyto-pathogenic agents [a]
				No. [a]	Type			
					1	2	3	
1962	late summer—early autumn	974	31 (3.2)	1 (0.1)	0	1	0	30 (3.1)
1963	late summer—early autumn	4 954	127 (2.6)	5 (0.1)	0	4	1	122 (2.5)
1964	late summer—early autumn	2 299	81 (3.5)	10 (0.4)	1	2	7	71 (3.1)
	late autumn—early winter	1 803	18 (1.0)	17 (0.9)	4	11	2	1 (0.1)
1965	late summer—early autumn	2 069	174 (5.7)	1 (0.05)	0	1	0	173 (5.6)
	late autumn—early winter	1 770	41 (2.3)	1 (0.06)	0	1	0	40 (2.3)
1966	late summer—early autumn	3 048	107 (5.2)	5 (0.2)	1	1	3	102 (5.0)
	late autumn—early winter	1 831	19 (1.4)	6 (0.3)	1	1	4	13 (0.7)
1967	late summer—early autumn	1 962	131 (6.7)	0	0	0	0	131 (6.7)
	late autumn—early winter	1 833	20 (1.1)	2 (0.1)	2	0	0	18 (1.0)
1968	late summer—early autumn	1 504	114 (7.6)	2 (0.1)	2	0	0	112 (7.4)
	late autumn—early winter	1 583	32 (2.0)	3 (0.2)	0	1	2	29 (1.8)

[a] The figures in parentheses indicate the percentage of the total number of specimens examined.

DISCUSSION

The safety and efficacy of live poliovaccine prepared with the Sabin strains has been established by extensive use of the vaccine in many countries (Sabin, 1962, 1965; *Bull. Wld Hlth Org.*, 1969). In Japan the Sabin vaccine was used throughout the country in the summer of 1961, when outbreaks of poliomyelitis occurred in the southwestern part of the country. Further extensive mass vaccination was carried out in 1962 and 1963 and routine immunization of newborn infants with 2 doses of trivalent vaccine has been undertaken since 1964. The incidence of paralytic cases decreased dramatically after the introduction of vaccination with the Sabin vaccines (Japan Live Poliovaccine Research Commission, 1967; Saito, 1966). Wild poliovirus strains have only rarely been isolated. The immunity status of the population, as judged by serological survey, is satisfactory. The present schedule of immunization of children against poliovirus appears to be satisfactory and it seems unlikely that wild virulent polioviruses introduced from abroad would cause an epidemic.

A Poliomyelitis Surveillance Committee (PSC) has

[1] Graphs showing the levels of immunity in 1961, 1963, 1965, and 1967 have been deposited in the WHO library. Copies of these graphs may be obtained on request to the Chief Librarian, World Health Organization, 1211 Geneva 27, Switzerland.

been established and 626 cases that occurred between 1962 and 1968 have been analysed. Of these 626 cases, 185 (29.6%) were classified as category A, i.e., clinically typical paralytic poliomyelitis. Laboratory examinations carried out on 120 patients in category A showed that 75 (62.5%) were positive for poliovirus infection and 45 (37.5%) were negative: tests were either not carried out or were unsatisfactory in the remaining 65 patients. Of the 75 cases of category A that were positive for poliovirus infection, 45 were temporally associated with LPV administration. The problem of the possible association of paralytic diseases with the vaccination with live poliovaccine has been discussed by many authors and it has been stressed that when vaccine-feeding coincides with the onset of a disease clinically indistinguishable from poliomyelitis the possibility of a different etiology should be considered (Sabin, 1964, 1965, 1969; Voroshilova, 1964; Ramos-Alvarez et al., 1969: *Bull. Wld Hlth Org.*, 1969). The epidemiological study of the category A cases in this country from 1962 to 1968 showed that the vaccine-associated cases were different in many respects from other cases of the same clinical category.

In addition to cases of typical poliomyelitis (category A) the reported cases included cases with atypical paralysis (category B). It is generally accepted that poliovirus is not etiologically related to these atypical cases, although the possibility that some relationship exists cannot be excluded in all cases. Any temporal association of category B cases with feeding of LPV is believed to be coincidental. The very low incidence of category B cases in temporal association with LPV feeding suggested that vaccine-associated category A cases were not necessarily coincidental. Ramos-Alvarez et al. (1969) reported paralytic syndromes associated with noninflammatory changes in the central nervous system. It appears that most cases of this type, if not all, are classified as category B by our clinical criteria. Cases with paralysis similar to that of poliomyelitis presumably caused by enteroviruses other than poliovirus may also be misleading when they are temporally associated with LPV feeding. Seventeen of the cases reported to the PSC during the past 7 years were infected with nonpoliomyelitis viral agents and 11 of them were classified as category A. Three of these 11 cases were temporally associated with vaccine feeding and were excluded from Table 6. Paralysis resulting from infection with echovirus, coxsackievirus or other viruses is usually considered to be transient or mild, and the present data seem to substantiate this conclusion. In contrast, most of the temporally vaccine-associated or vaccine-related category A cases had residual paralysis. Of the 68 temporally vaccine-associated cases, 50 showed some residual disability and 15 recovered completely (Table 5). No fatal case has ever been reported. After consideration of the results of laboratory tests it was finally concluded that 45 of the cases that occurred in the last 7 years, including 36 cases with residual disability, should be regarded as vaccine-related (Table 6). During this period a total of 43 million doses of vaccine of each type were administered. However, most of the children vaccinated in 1962 and 1963 were already immune as a result of natural infection with wild poliovirus or as a result of the administration of one dose of trivalent vaccine in 1961 during the epidemic season; at that time it was not possible to collect detailed records of vaccine-associated paralysis. It is more reasonable to assess the possible risk of feeding live poliovirus vaccine to fully susceptible infants. Every year about 1.6 million newborn infants have been vaccinated with two doses of each type of vaccine and 36 vaccine-related cases have been observed among the total of more than 11 million infants vaccinated during the past seven years. As trivalent vaccine was used it is impossible to estimate the number of cases of each type but it is probably less than 3.0 per million doses of trivalent vaccine. The risk is thus extremely small and does not detract from the great efficacy of Sabin vaccine which is one of the most effective and safest ways of preventing paralytic poliomyelitis.

RÉSUMÉ

LA POLIOMYÉLITE AU JAPON PENDANT LA PÉRIODE 1962-68 APRÈS L'INTRODUCTION DE LA VACCINATION DE MASSE PAR LE VACCIN SABIN

Depuis la mise en application de la vaccination de masse des enfants appartenant aux groupes d'âge réceptifs, en été 1961, l'incidence de la poliomyélite a fortement décru au Japon. En 1962 et 1963, on a procédé en outre à la vaccination des enfants jusqu'à l'âge de 13 ans. A partir de 1964, tous les nouveau-nés ont été immunisés

par l'administration systématique de deux doses de vaccin Sabin trivalent.

De 1962 à 1968, on a dénombré officiellement un total de 659 cas paralytiques, l'incidence annuelle passant de 289 en 1962 à 20 en 1968. L'analyse fouillée de 626 cas signalés à la Commission de surveillance de la poliomyélite a révélé que 185 d'entre eux (29,6%) étaient des cas de poliomyélite paralytique typiques tandis que 352 (56,2%) étaient des cas atypiques considérés comme n'étant pas causés par la poliomyélite. Pour les 89 cas restants (14,2%), les symptômes cliniques ne concordaient pas avec le diagnostic de poliomyélite paralytique. En moyenne, de 1962 à 1968, on a enregistré chaque année moins de 1% du nombre des cas signalés avant la mise en œuvre de la vaccination de masse. En dépit de recherches intensives, on a rarement isolé des souches sauvages de poliovirus tant à partir des cas de poliomyélite paralytique que parmi les enfants en bonne santé. Des enquêtes annuelles portant sur plusieurs milliers d'échantillons de sérum ont montré qu'une forte proportion de la population était porteuse d'anticorps antipoliomyélitiques. Sur 43 millions de vaccinations effectuées de 1962 à 1968, dont plus de 11 millions chez des nourrissons, on a enregistré 45 cas de poliomyélite associés dans le temps à la vaccination.

Il résulte de l'ensemble des données recueillies que le vaccin Sabin est remarquablement inoffensif et efficace et que l'éradication de la poliomyélite peut être considérée comme pratiquement acquise au Japon.

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